

京都大学教育研究振興財団助成事業
成 果 報 告 書

平成 30年 11月 20日

公益財団法人京都大学教育研究振興財団
会 長 藤 洋 作 様

所属部局・研究科 大学院農学研究科・域環境科学専攻

職 名・学 年 博士課程3年

氏 名 Nguyen Xuan Dong

助成の種類	平成 30年度 ・ 国際研究集会発表助成		
研究集会名	The 9th International Conference on Mushroom Biology and Mushroom Products		
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発表題目	Functional Analysis of promoters using Transfection, Random Integration and Gene Knock-in in Mushroom-forming fungi		
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渡航期間	平成 30年 11月 11日 ~ 平成 30年 11月 16日		
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合計155,670円に助成金を充当			
当財団の助成について	(今回の助成に対する感想、今後の助成に望むこと等お書き下さい。助成事業の参考にさせていただきます。)		

成果の概要/ Nguyen Xuan Dong

Program: the 9th International Conference on Mushroom Biology and Mushroom Products (9th ICMBMP)

Venue: Holiday Inn Shanghai Hongqiao, Shanghai, China

Date: November 12- November 15, 2018

Title of my presentation

Functional Analysis of Promoters Using Transfection, Random Integration and Gene Knock-in in Mushroom-Forming Fungi

The International Conference on Mushroom Biology and Mushroom Products (ICMBMP) founded in 1993 by World Society for Mushroom Biology and Mushroom Products. At the beginning, this conference only focus on scientific research of edible and medicinal mushrooms, and the development and marketing of mushroom products. But now day, WSMBMP conference cover various aspects of mushroom science and the mushroom industry, such as mushroom taxonomy, genetics and molecular biology, but also cultivation technique, pests and diseases and quality control.

This year, the 9th ICMBMP hold in Shanghai and Zhangzhou, China from November 12-19, 2018. The academic conference took place in Shanghai from November 12-15, and the mushroom product exhibition was hold together with the 12th Chinese Mushroom Days from November 16-19 in Zhangzhou, Fujian Province. The 9th ICMBMP incorporated the latest advances relating to all aspects of mushroom biology and mushroom products in the form of keynote lectures, oral presentations and poster displays. Panel topics include 1) Diversity and Taxonomy; 2) Omics and Bioinformatics; 3) Genetics and Breeding; 4) Physiology and Development; 5) Mycosourced Molecules and their Nutritional and Medicinal Properties; 6) Mushroom Cultivation, Substrates, Factory Production and Equipment Innovations; 7) Pest and Disease Management; 8) Product Quality and Safety Controls; 9) Mushroom Economics and Cultural Impacts. In this conference, the latest participation count stands at about 570 participants from 30 countries over the world. And 108 oral presentation and 52 posters were presented at that time.

I made my oral presentation om 14 November, 2018 and a title is: ‘Functional analysis of promoters using transfection, random integration and gene knock-in in mushroom-forming fungi’. The presentation is about investigation molecular mechanism underlying transcriptional regulation in Agaricomycetes. We know that transcription initiation and its regulation play the crucial role in the activation and suppression of gene expression, and are mainly controlled by DNA elements including the core element and others *cis*-acting elements in the gene promoter. Even though many studies have been conducted to identify and characterize *cis*-acting element in eukaryote, and some papers have reported existence of putative *cis*-acting elements in mushroom. Their

function is still vague in mushroom due to lack of an appropriate system to analyse promoter. Therefore, we try to apply three promoter assay systems; transfection, random integration and gene knock-in to elucidate *cis*-acting elements in mushroom promoters. From our results, new core promoter element was found out in β_1 -*tubulin* promoter of Agaricomycetes, and location of Avicel-responsive element and Manganese-responsive element are continuously finding in *Coprinopsis cinerea Cel6A* and *Pleurotus ostreatus mnp3* promoter, respectively. Our result also suggested the advantages and disadvantages of three different promoter assays: 1) Transfection is very powerful tool to identify concrete sequence of *cis* elements, but it requires to establish a suitable selection system in each fungus. 2) Random integration can be rather widely applied to species that can be genetically transformed but we have to be careful about different positions and copy numbers of the reporter on the chromosome. 3) Knock-in seems most appropriate method to confirm the function of a putative *cis* element, but it requires a special host strain deficient in Non-Homologous End Joining system. And it is to be considered if the integrated site has the same regulatory property as the original position of the promoter of interest on the chromosome. After finished my presentation, I got many useful comments to improve my study, and interested questions from audiences.

During the conference, I attended workshop ‘Genetic diversity and molecular breeding in cultivated mushrooms’ and varieties of presentation and key note speech, which inspired me with new ideas and knowledge. I also had a very good discussion and interaction with many experts of my field. All these learning is very useful to improve my study in coming days.

Finally, I would like to thank “京都大学教育研究振興財団” again for your grant of “国際研究集会発表助成”.



Figure 1: ‘Genetic diversity and molecular breeding in cultivated mushrooms’ workshop



Figure 2: My oral presentation in 9ICMBMP